

What is claimed is:

Sub B1
1 1. A method for processing a substrate, comprising exposing a patterned substrate
2 surface to a plasma comprising argon, helium and hydrogen in a processing chamber.

1 2. The method of claim 1, wherein the plasma comprises less than about 75% by
2 volume of argon.

1 3. The method of claim 2, wherein hydrogen is provided to the processing chamber in
2 a mixture of about 95% helium by volume and about 5% hydrogen by volume.

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Sub A1
1 4. The method of claim 1, wherein etch rate increases when helium content is
2 increased.

1 5. The method of claim 1, wherein the substrate surface comprises silicon oxide or
2 silicon nitride.

1 6. The method of claim 1, wherein the plasma is capacitively and inductively
2 powered.

1 7. The method of claim 1, wherein the processing chamber is maintained at a pressure
2 from about 1 mTorr to about 200 mTorr.

Sub A2
1 8. A method for processing a substrate, comprising:

2 (a) exposing a patterned substrate surface to a plasma comprising argon,
3 helium and hydrogen in a reaction chamber; and

4 (b) increasing the helium content of the plasma to increase etching of the
5 patterned substrate surface.

1 9. The method of claim 8, wherein the plasma comprises less than about 75% by
2 volume of argon.

Sub 1
AS 2 } 10. The method of claim 9, wherein hydrogen is provided to the reaction chamber in a mixture of about 95% helium by volume and about 5% hydrogen by volume.

1 11. The method of claim 8, wherein the substrate surface comprises silicon oxide or
2 silicon nitride.

1 12. The method of claim 8, wherein the plasma is capacitively and inductively
2 powered.

1 13. The method of claim 1 wherein the reaction chamber is maintained at a pressure
2 from about 1 mTorr to about 200 mTorr.

1 14. A method for processing a substrate, comprising:

2 (a) exposing a patterned substrate surface to a plasma comprising argon,
3 helium and hydrogen in a reaction chamber, wherein the plasma is capacitively and
4 inductively powered; and

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AS 6 } (b) increasing the helium content of the plasma to increase cleaning of the
7 patterned substrate surface, wherein the plasma comprises less than about 75% by volume
of argon.

1 15. The method of claim 14, wherein hydrogen is provided to the reaction chamber in
2 a mixture of about 95% helium by volume and about 5% hydrogen by volume.

1 16. The method of claim 15, wherein the substrate surface comprises silicon oxide or
2 silicon nitride.

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AS 2 } 17. The method of claim 14, wherein the reaction chamber is maintained at a pressure
from about 1 mTorr to about 200 mTorr.

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He }
add
O₂ }

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